CEV427 Analysis of Environmental Systems
Fall 2022

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Course Schedule:
Day: Tuesdays, 14:00 – 16:50 (Classroom 210)
Night: Tuesdays, 17:00 – 19:40 (Classroom 210)

Course Homepage: http://rkgoktas.wordpress.com/CEV427

Course Objectives: The objective of this course is to provide an introduction to system thinking as applied to environmental problems. The techniques for understanding the dynamics of environmental systems are covered at an introductory level. The basics of system dynamics modeling techniques are covered. Complex environmental problems are qualitatively analyzed by the help of the recent literature through reading and writing assignments, as well as class discussions.

Course Content: Introduction to systems thinking. Introduction to systems analysis. System dynamics models and simulation analysis. System thinking in environmenal science and engineering. Complex environmental problems (e.g. climate change, human population growth).

At the end of this course, you will:
- *have an introductory understanding of systems thinking*
- *have an introductory understanding of complex systems*
- *develop basic skills for the analysis of environmental systems*

RESOURCES

Textbook
- Modeling the Environment, 2nd Edition. 2010. Andrew Ford.

References
- Dynamic Modeling of Environmental Systems. 1999. Micheal L. Deaton & James J. Winebrake. Springer.
- Thinking in Systems: A Primer. 2008. Donella H. Meadows.
- System Dynamics: System Feedback Modeling for Policy Analysis, 2002. Yaman Barlas. Encyclopedia of Life Support Systems (EOLSS), UNESCO Publishing, Paris-Oxford

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Grading

Activity	Quantity	%
Homeworks	2	56
Class Participation	1	14
Final Exam	1	30

Tentative Syllabus

Date	What is going to be covered?
20 September 2022	Introduction
27 September 2022	Introduction to System Structure and Behaviour
4 October 2022	Introduction to Dynamic Modeling of Environmental Systems
11 October 2022	Introduction to System Dynamics Simulation Software
18 October 2022	System Dynamics Simulations with Insight Maker
25 October 2022	Stocks and Flows: The Building Blocks of System Dynamics Models
1 November 2022	Numerical Simulation of Dynamic System Models
8 November 2022	Water Flows in the Mono Basin (Case Study I)
15 November 2022	Equilibrium Diagrams
22 November 2022	Case Study II
29 November 2022	S-Shaped Growth
6 December 2022	Case Study III
13 December 2022	Strategies for Analyzing and Using Environmental Systems Models
20 December 2022	*Modeling Homework Presentations*